***Mabuya cumingi* (Reptilia: Scincidae): An Addition to the Herpetofauna of Lanyu Island, Taiwan**

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Abstract: An adult male *Mabuya*, recently collected from Lanyu Island, Taiwan, was identified as *Mabuya cumingi*, a species hitherto known only from Luzon Island of the Philippines, on the basis of small body size (56.6 mm in snout-vent length), embossed dorsal head scales, five scales beneath toe I, and the presence of a dark middorsal stripe. Occurrence of this species on Lanyu Island was also confirmed by additional sighting records. *Mabuya cumingi* is regarded as a fourth reptile species representing a dispersal to this island from the Philippines.

Key words: *Mabuya cumingi*; *Mabuya multicarinata*; Scincidae; Lanyu Island; Taiwan; Philippines

INTRODUCTION

Lanyu Island is an islet of 45.7 km² in area and 548 m in height, and is located ca. 60 km southeast of the main island of Taiwan and ca. 390 km north of Luzon Island, the Philippines. Since the description of *Gekko kikuchii* by Oshima (1912), a total of 18 species of reptiles, including three possible human commensals (*Hemidactylus frenatus*, *Hemiphyllodactylus typus typus*, and *Ramphotyphlops braminus*) and 15 putative native species, have been recorded from this island (Ota, 1991a,b; Lue et al., 1999).

A number of previous biogeographers ar-

gued that the fauna of Lanyu Island is characterized by a higher proportion of Philippine elements when compared with that of the main island of Taiwan (e.g., Kuroda, 1925; Kano, 1933, 1936). Of the 15 putative native reptiles hitherto known from Lanyu Island, three (*G. kikuchii*, *Lepidodactylus yami*, and *Mabuya multicarinata borealis*) are classified as the Philippine elements, whereas most of the remaining species are considered to represent dispersals from the main island of Taiwan (Ota, 1991a,b).

Recently, one of us (WH) collected a specimen of a strange skink from Lanyu Island. This specimen, deposited in the herpetological collection of the National Museum of Natural Science, Taichung, as NMNS 3371, had keeled scales on the dorsum of the body and completely separated pterygoids with a palatal notch extending

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forwards to the level of the center of the eye, and thus was identified as a member of the genus *Mabuya* (see Greer [1970, 1977]). In this paper, we describe external characters of this specimen in detail, and compare it with species of *Mabuya* known from Taiwan and the Philippines to determine its specific status.

MATERIAL AND METHODS

The specimen was collected by hand from sparse grass near the coast, 3 km north of Tung-Ching Village, Lanyu Island (22°04'N, 121°33'E), on 17 July 1999. After being photographed in life (Fig. 1), the lizard was fixed in 10% formalin, preserved in 70% ethanol, and then subjected to detailed examination of morphological characters. Measurements were taken to the nearest 0.1 mm with dial calipers. Definitions of characters follow those of Brown and Alcalá (1980).

RESULTS

Description of the present specimen

A male with well-developed testes and

convoluted epididymides; snout-vent length (SVL) 56.6 mm; tail length 99.4 mm; head length 12.2 mm; head width 8.1 mm; snout-eye length 4.7 mm; eye length 3.5 mm; ear length 1.1 mm; snout-forelimb distance 20.8 mm; axilla-groin distance 28.8 mm; forelimb length 17.7 mm; hindlimb length 25.8 mm.

Snout largely tapered, but rounded at tip; scales on dorsal surface of head embossed; rostral approximately twice as broad as high, rounded dorsally, in contact with frontonasal; supranasals long, narrow, not in contact at midline; frontonasal nearly as broad as frontal, in contact with frontal; prefrontals separated at midline; frontal elongate, broadly in contact with second supraoculars; supraoculars four, first smallest, second largest; frontoparietals not fused; interparietal incomplete, fused to parietals posteriorly; nuchals in two pairs; postnasal absent; anterior loreal distinctly higher than long, much shorter than posterior loreal; supralabials seven, fifth largest, beneath eye; seven infralabials; ear small, without lobules; each scale on dorsal and lateral surfaces of body with six or seven keels, ventral scales smooth, or slight-

FIG. 1. Dorsolateral view of the specimen of *Mabuya cumingi* from Lanyu Island, Taiwan (NMNS 3371; SVL = 56.6 mm).

ly rugose; 30 rows of scales around mid-body; 43 vertebral scale rows between parietals and base of tail just above vent; preanals slightly enlarged; limbs well developed; finger III almost as long as finger IV; toe IV distinctly longer than toe III; subdigital scales 5–5, 9–9, 14–14, 15–15 and –8 on left-right fingers I, II, III, IV and V (left finger V damaged), and 5–5, 10–10, 15–16, 21–21 and 13–13 on left-right toes I, II, III, IV and V, respectively; tail not damaged or regenerated.

In life, dorsal surfaces of head and body light grayish tan, with black middorsal stripe; additional longitudinal black stripes, separated from each other by white interspaces, in dorsolateral, lateral, and ventrolateral regions; lateral stripe, running from nasal and eye to above base of hindlimb broad, the others narrower (Fig. 1). In preservative, dorsal ground color and white interspaces faded to dark gray and light gray, respectively, making longitudinal dark stripes indistinct.

Comparisons

Three species of *Mabuya*, *M. longicaudata*, *M. multifasciata*, and *M. multicarinata borealis*, have been recorded from Taiwan (Ota et al., 1994; Lue et al., 1999). The present specimen differs from the three spe-

cies in a much smaller body size, because adult SVLs of these species well exceed 60 mm (Okada et al., 1992; Ota et al., 1994). Furthermore, it differs from *M. longicaudata* and *M. multifasciata* in having distinctly embossed head scales, because in the latter species, scales covering the dorsal surface of head are smooth, or only slightly rugose (Ota et al., 1994). From *M. multicarinata borealis*, the present specimen also differs in having a greater number of vertebral scale rows (43, vs. 34–41), fewer scales beneath toe IV (21, vs. 24–28), and a distinct middorsal stripe (vs. no middorsal stripe: Ota, 1991a).

Most of those and other characteristics of NMNS 3371 are shared with *M. cumingi* and *M. indepressa* from the Philippines (Brown and Alcala, 1980). So, we compare the present specimen with these two species in detail (Table 1). Brown and Alcala (1980) reported that both of these Philippine species have a distinct interparietal which almost always separates parietals completely. In the present specimen, however, the interparietal is incomplete because it is fused with parietals posteriorly. The Lanyu specimen differs from *M. indepressa* in having shorter hindlimbs in relation to the axilla-groin distance, and fewer scales beneath toe I. States of these and

TABLE 1. Comparisons of characters among the Lanyu specimen of *Mabuya*, and *M. cumingi* and *M. indepressa* from the Philippines. Abbreviations are: SVL, snout-vent length; HLL, hindlimb length, AGD, axilla-groin distance; IP, interparietal; MSR, midbody scale rows; VS, vertebral scale rows; TIS, subdigital scales beneath the toe I; TIVS, subdigital scales beneath the toe IV.

Character	Lanyu specimen	<i>M. cumingi</i> *	<i>M. indepressa</i> *
SVL (mm)	56.6	39.5–54.0	45.6–66.6
HLL/AGD (%)	90.0	74–96	94–116
HLL/SVL (%)	45.6	37–45	45–58
IP	incomplete	distinct	distinct
MSR	30	28–32	30–34
VS	43	40–47	41–48
TIS	5	5–6	6–8
TIVS	21	16–21	18–24

* Data for these species in the Philippines were taken from Brown and Alcala (1980).

most other characters in the present specimen are shared with *M. cumingi*, except for SVL, which is slightly greater in the Lanyu specimen than in the latter.

DISCUSSION

Morphological comparisons indicate that the Lanyu specimen most resembles *M. cumingi*, but differs from the species in having slightly greater SVL and an incomplete interparietal. Considering that the body size often varies extensively among conspecific insular populations in reptiles (see Ota et al [1995] and papers referred therein for examples), such a difference in SVL between the present specimen and *M. cumingi* from the Philippines may have little taxonomic significance. Moreover, it is probable that the interparietal condition in the Lanyu specimen represents an anomaly rather than a stable population feature. We thus identify the specimen as *M. cumingi*. Further detailed analysis of variation on the basis of additional specimens is desired to verify those assumptions.

During the fieldwork on Lanyu Island in 1995 (by HO) and 1997–1999 (by WH), both of us observed several other individuals with body size and color pattern similar to those of the present specimen. Thus, although the present record was made only on the basis of a single voucher specimen, we are almost certain that there is an established breeding population of *M. cumingi* on Lanyu Island. All individuals sighted were found in relatively open environments near the coast, and appeared to be most active on clear mornings and at dusk.

In the synopsis of the lizards of Taiwan, Lin and Cheng (1990) provided three color photographs as those of *M. multicarinata*. The animals photographed, however, showed a color pattern almost identical with that of the present specimen including a distinct middorsal stripe on body. Therefore, although the locality of the individual photographed was not given in that book, it is

most likely that it actually represented *M. cumingi* from Lanyu Island rather than *M. multicarinata*.

Since the original description by Brown and Alcala (1980), *Mabuya cumingi* has been known only from Luzon Island. Thus, the present finding seems to represent another example of reptilian dispersals to Lanyu Island from the Philippines (Ota, 1991a, b).

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